

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): J.M. Barnes et al. Examiner Scott C. Sun  
Serial No. 10/719,129 Group Art Unit 2182  
Filed November 20, 2003 Docket No. TUC920030145US1  
TITLE METHOD, SYSTEM, AND PROGRAM FOR THROTTLING DATA  
TRANSFER

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**CERTIFICATE UNDER 37 CFR 1.8:**

I hereby certify that this correspondence is being transmitted by facsimile to Scott C. Sun of the U.S. Patent and Trademark Office at 571-273-8300 on April 10, 2006.

  
Janaki K. Davda

**Reply under 37 CFR 1.116 - Expedited Procedure**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Examiner:

Amendments to the Specification begin on page 2.

Amendments to the Claims are reflected in the listing of claims which begins on page 3.

Remarks/Arguments begin on page 8.

**Amendments to the Specification**

Please replace paragraph 46 on page 14, with the following rewritten paragraph:

[0046] In block 602, each resource management process 224 determines whether the resource usage is at or above a high threshold (also referred to as a "high watermark") and below a final threshold. If resource usage is at or above the high threshold, processing continues to block 604, otherwise, processing continues to block 606. In block 604, each resource management process 224 broadcasts a high watermark message to one or more primary control units that are using the largest amount of resources ~~and then processing loops back to block 600~~ and that have not already received high watermark messages without subsequent low watermark messages ~~and then processing loops back to block 600~~. For example, if primary control units A, B, and C are each using 2 percent of cache, while all other primary control units are each using 1 percent of cache, then primary control units A and B may be sent high watermark messages. Then, the next time the resource management process 224 is selecting one or more primary control units to receive a high watermark message, primary control unit C may be selected.

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1. (Currently Amended) A method for throttling data transfer, comprising:  
determining an amount of resources that are in use;

when the amount of resources reaches a high threshold, notifying one or more primary control units to temporarily stop sending data by sending a message, wherein the one or more primary control units that are notified to temporarily stop sending data are selected based on which ones are using a largest amount of resources; and

when the amount of resources reaches a low threshold, notifying each previously notified primary control unit to resume sending data by sending a message.

2. (Original) The method of claim 1, wherein all primary control units are notified to temporarily stop sending data.

3. (Original) The method of claim 1, further comprising:

at a primary control unit, resuming sending data after a predetermined period of time has expired without receipt of notification to resume sending data.

4. (Original) The method of claim 1, further comprising:

when the amount of resources used is above a final threshold, re-notifying the one or more primary control units to temporarily stop sending data.

5. (Original) The method of claim 1, wherein at least one of the resources is a cache.

6. (Original) The method of claim 1, wherein the amount is measured by a percentage.

7. (Currently Amended) The method of claim 1, wherein the one or more primary control units ~~that are notified to temporarily stop sending data are selected based on an amount of resources being used by each primary control unit~~ selected have not already received a message to temporarily stop sending data without a subsequent message to resume sending data.

8. (Original) The method of claim 7, further comprising:  
maintaining information on the amount of resources being used by each primary control unit.

9. (Currently Amended) An article of manufacture including a program for throttling data transfer, wherein the program causes operations to be performed, the operations comprising:  
determining an amount of resources that are in use;

when the amount of resources reaches a high threshold, notifying one or more primary control units to temporarily stop sending data by sending a message, wherein the one or more primary control units that are notified to temporarily stop sending data are selected based on which ones are using a largest amount of resources; and

when the amount of resources reaches a low threshold, notifying each previously notified primary control unit to resume sending data by sending a message.

10. (Original) The article of manufacture of claim 9, wherein all primary control units are notified to temporarily stop sending data.

11. (Original) The article of manufacture of claim 9, wherein the operations further comprise:

at a primary control unit, resuming sending data after a predetermined period of time has expired without receipt of notification to resume sending data.

12. (Original) The article of manufacture of claim 9, wherein the operations further comprise:

when the amount of resources used is above a final threshold, re-notifying the one or more primary control units to temporarily stop sending data.

13. (Original) The article of manufacture of claim 9, wherein at least one of the resources is a cache.

14. (Original) The article of manufacture of claim 9, wherein the amount is measured by a percentage.

15. (Currently Amended) The article of manufacture of claim 9, wherein the one or more primary control units that are notified to temporarily stop sending data are selected based on an amount of resources being used by each primary control unit selected have not already received a message to temporarily stop sending data without a subsequent message to resume sending data.

16. (Original) The article of manufacture of claim 15, wherein the operations further comprise:

maintaining information on the amount of resources being used by each primary control unit.

17. (Currently Amended) A system for throttling data transfer, comprising:  
means for determining an amount of resources that are in use;  
means for when the amount of resources reaches a high threshold, notifying one or more primary control units to temporarily stop sending data by sending a message, wherein the one or more primary control units that are notified to temporarily stop sending data are selected based on which ones are using a largest amount of resources; and

means for when the amount of resources reaches a low threshold, notifying each previously notified primary control unit to resume sending data by sending a message.

18. (Original) The system of claim 17, wherein all primary control units are notified to temporarily stop sending data.

19. (Original) The system of claim 17, further comprising:

at a primary control unit, means for resuming sending data after a predetermined period of time has expired without receipt of notification to resume sending data.

20. (Original) The system of claim 17, further comprising:

when the amount of resources used is above a final threshold, means for re-notifying the one or more primary control units to temporarily stop sending data.

21. (Original) The system of claim 17, wherein at least one of the resources is a cache.

22. (Original) The system of claim 17, wherein the amount is measured by a percentage.

23. (Currently Amended) The system of claim 17, wherein the one or more primary control units that are notified to temporarily stop sending data are selected based on an amount of resources being used by each primary control unit selected have not already received a message to temporarily stop sending data without a subsequent message to resume sending data.

24. (Original) The system of claim 23, further comprising:

means for maintaining information on the amount of resources being used by each primary control unit.

#### REMARKS/ARGUMENTS

Claims 1-24 are pending in the application. Claims 1, 7, 9, 15, 17, and 23 have been amended. Reconsideration is respectfully requested. Applicants submit that the pending claims 1-24 are patentable over the art of record and allowance is respectfully requested of claims 1-24.

Applicants would like to thank Examiner Sun for holding a telephone interview with their representative, Janaki K. Davda, on Friday, April 7, 2006 at 1:00 EST. Claim 1 and the cited prior art were discussed. No agreement was reached.

Claims 1, 5-8, 9, 13-16, 17, and 21-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Reinemann (Pub. US 2003/0115118 A1) in view of Tzeng et al. (US 2003/0210651). Applicants respectfully traverse. Also, Applicants note that paragraph 11 of the final Office Action cites a 102(e) rejection, but paragraph 10 refers to 103(a). In light of this and because multiple references are cited, Applicants will treat the rejection as a 103(a) rejection.

Amended claim 1 describes throttling data transfer. An amount of resources that are in use is determined. When the amount of resources reaches a high threshold, one or more primary control units are notified to temporarily stop sending data by sending a message, when the amount of resources reaches a high threshold, notifying one or more primary control units to temporarily stop sending data by sending a message, wherein the one or more primary control units that are notified to temporarily stop sending data are selected based on which ones are using a largest amount of resources (e.g., Specification, page 14, paragraph 46; FIG. 6). When the amount of resources reaches a low threshold, each previously notified primary control unit is notified to resume sending data by sending a message. For example, if primary control units A, B, and C are each using 2 percent of cache, while all other primary control units are each using 1 percent of cache, then primary control units A and B may be sent messages to temporarily stop sending data (e.g., Specification, page 14, paragraph 46). Then, the next time the resource management process 224 is selecting one or more primary control units to receive a message to temporarily stop sending data, primary control unit C may be selected (e.g., Specification, page 14, paragraph 46).

Amended claim 7 describes that the one or more primary control units selected have not already received a message to temporarily stop sending data without a subsequent message to resume sending data(e.g., Specification, page 14, paragraph 46; FIG. 6). For example, with reference to the previous example of primary control units A, B, and C each using 2 percent of cache, with primary control units A and B having been sent messages to temporarily stop sending data, the next time the resource management process 224 is selecting one or more primary control units to receive a message to temporarily stop sending data, primary control unit C may be selected (e.g., Specification, page 14, paragraph 46).

In the final Office Action, the Examiner submits that Reinemann "discloses setting a flag causes a hosted process I/O to 'return a disk-full error message' in paragraph 35". The Examiner submits that setting a flag anticipates "notifying by sending a message" because the claims do not include the limitation that "the message is not an error message". Applicants respectfully traverse. Claim 1 states "notifying one or more primary control units to temporarily stop sending data by sending a message" (emphasis added). Thus, the claim describes that the message is sent to notify the one or more primary control units to temporarily stop sending data.

In paragraph 16, the Reinemann patent application describes that a sharing policy specifies an upper limit, based on the age of the processor, for the amount of resources that a processor can consume. Each of the shared resources is monitored to assure the overall utilization of that resources is within the pre-determined upper threshold of the target range, the value of which can vary from one resource to another (paragraph 25). That is, an upper limit is associated with each processor and is used to determine whether that processor is exceeding its upper threshold. This, however, does not teach or suggest that the one or more primary control units that are notified to temporarily stop sending data are selected based on which ones are using a largest amount of resources.

Applicants respectfully submit that the Tzeng patent application also does not teach or suggest that the one or more primary control units that are notified to temporarily stop sending data are selected based on which ones are using a largest amount of resources.

Applicants respectfully submit that, even if combined, the Reinemann patent application and the Tzeng patent application do not teach or suggest that the one or more primary control units that are notified to temporarily stop sending data are selected based on which ones are using a largest amount of resources.

Therefore claim 1 is not taught or suggested by the Reinemann patent application or the Tzeng patent application, either alone or together. Claims 9 and 17 are not taught or suggested by the Reinemann patent application or the Tzeng patent application, either alone or together, for at least the same reasons as were discussed with respect to claim 1.

Dependent claims 5-8, 13-16, and 21-24 incorporate the language of independent claims 1, 9, and 17 and add additional novel elements. Therefore, dependent claims 5-8, 13-16, and 21-24 are not taught or suggested by the Reinemann patent application or the Tzeng patent application, either alone or together, for at least the same reasons as were discussed with respect to claims 1, 9, and 17.

Claims 2, 10, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinemann and Tzeng in further view of Applicants' admitted prior art. Applicants respectfully traverse.

As discussed above, neither the Reinemann patent application nor the Tzeng patent application, either alone or in combination, teaches or suggests the subject matter of claim 1. Applicants' respectfully submit that Applicants' Description of Related Art section does not cure the defects of the Reinemann and Tzeng patent applications as it does not teach or suggest selecting one or more primary control units that are notified to temporarily stop sending data based on which ones are using a largest amount of resources.

Dependent claims 2, 10, and 18 incorporate the language of independent claims 1, 9, and 17 and add additional novel elements. Therefore, dependent claims 2, 10, and 18 are not taught or suggested by the Reinemann patent application, the Tzeng patent application or Applicants' admitted prior art, either alone or in combination for at least the same reasons as were discussed with respect to claims 1, 9, and 17.

Claims 3-4, 11-12, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinemann and Tzeng and further in view of Wong (Pub. US 2004/0003069 A1). Applicants respectfully traverse.

As discussed above, neither the Reinemann patent application nor the Tzeng patent application, either alone or in combination, teaches or suggests the subject matter of claim 1.

The Wong patent application does not cure the defects of the Reinemann and Tzeng patent applications. For example, the Wong patent application does not teach or suggest selecting one or more primary control units that are notified to temporarily stop sending data based on which ones are using a largest amount of resources.

Applicants respectfully submit that, even if combined, the Reinemann patent application, the Tzeng patent application, and the Wong patent application do not teach or suggest the subject matter of claims 1, 9, and 17. Therefore, claims 1, 9, and 17 are not taught or suggested by the Reinemann patent application, the Tzeng patent application or the Wong patent application, either alone or together.

Dependent claims 3-4, 11-12, and 19-20 incorporate the language of independent claims 1, 9, and 17 and add additional novel elements. Therefore, dependent claims 3-4, 11-12, and 19-20 are not taught or suggested by the Reinemann patent application, the Tzeng patent application or the Wong patent application, either alone or in combination, for at least the same reasons as were discussed with respect to claims 1, 9, and 17.

#### Conclusion

For all the above reasons, Applicants submit that the pending claims 1-24 are patentable over the art of record. Applicants have not added any claims. Nonetheless, should any additional fees be required, please charge Deposit Account No. 09-0466.

The attorney of record invites the Examiner to contact her at (310) 553-7973 if the Examiner believes such contact would advance the prosecution of the case.

Dated: April 10, 2006

By: 

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